

[1010] An exact calculation of the volume of fluid in a reservoir may be used to verify the measurement system of the pumping device. For example, following the use of the disposable, where the system either stores, or, receives via an input the before-use weight at fill of the disposable, the system, taking the after-use weight, may determine the volume of fluid difference between before-use and after-use. This information may be used as a check to the pumping system to verify the amount of fluid pumped from the given reservoir.

[1011] Additionally, the exact volume of fluid filled may be entered into the pumping system which may be used by the system to warn the user of low-volume reservoir or present to the user an accurate volume of fluid remaining in the reservoir at any given time.

[1012] Referring now to FIG. 205, one embodiment of the system includes a combination charger, disposable fill and integrity verification station 2900. The charger station 2900 includes a charging section 2902 for a reusable assembly, a charging section 2904 for a remote control device, and a weight scale 2906. The weight scale 2906 in some embodiments may be sized to accommodate a disposable assembly 2908. In the exemplary embodiment, the station also includes a fill adapter septum 2910 that accepts a filling cap 2912 (including a filling needle for piercing the septum 2910). In some embodiments, the filling needle is attached to a fluid line 2914 which may be a flexible tubing of a predetermined length suitable for reaching around the station 2900 to, in some embodiments, a fluid vial or fluid container holder 2916. The container holder 2916 may be sized to accommodate a fluid vial 2918. In addition to the features shown in FIG. 205, in some embodiments, the station 2900 may include a pump for pumping the fluid from the container 2918 into the disposable assembly 2908. In some embodiments, the pump may be a peristaltic pump. However, in other embodiments, the pump may be a diaphragm pump or any of pump known in the art. The pump may be used to automatically fill the reservoir in the disposable 2908. In some embodiment, a user attaches the container cap 2920 (including a needle) to the fluid container 2918 as well as the filling cap 2912 to the fill adapter septum 2910. The pump evacuates air from the disposable and uses it to pressurize the vial. The pump then pulls fluid from the container 2918 and fills the disposable 2908 reservoir. Also, whilst filling the reservoir, the system may provide enough positive pressure to additionally prime the fluid path and the cannula of the disposable.

[1013] In some embodiments, the station 2900 may also include a display for communication to a user of the volume of fluid currently in the disposable 2908. This may be used to fill the reservoir to a desired volume. Additionally, in some embodiments, the station 2900 may wirelessly communicate to a remote controller (not shown) or other device, the volume of fluid filled into the reservoir. In some embodiments, when a user is finished with a disposable, the user will weight the after-use disposable. The system will communicate with the pumping system and correlating the data, an integrity verification test may be performed. Where a system integrity error is determined, the system may alarm the user appropriately.

[1014] In other embodiments, a station may include a weight scale and any one or more of the various other components of the station 2900 as discussed above. Still

referring to FIG. 205, the system may be portable and the scale portion 2922 may slide into the charger portion 2924, protecting the integrity of the scale as well as providing convenient portability.

[1015] Thus, this system has many benefits, including, but not limited to, off-board integrity verification of volume sensing at each disposable change; accurate determination of volume at fill to both accurately track current reservoir volume and thus alarm user when volume is low; method for avoiding under-desired-volume filling or over-desired-volume filling; method of filling a disposable with fluid while also pre-priming (or purging the air) the disposable fluid line; and verification of volume regardless of disposable manufacture variability.

[1016] While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention.

What is claimed is:

1. A method for preparing a disposable housing assembly to engage with a reusable, housing assembly, the method comprising:

providing a disposable housing assembly, wherein the disposable housing assembly comprises a reservoir;
providing an adapter to releasably engage with the disposable housing assembly, wherein the adapter comprises a filling aid and wherein the filling aid comprises a guide passage;

providing a syringe comprising a needle;

filling the reservoir of the disposable housing assembly with the syringe utilizing the guide passage of the adapter;

providing a reusable housing assembly configured to releasably engage with the disposable housing assembly;

disengaging the adapter from the disposable housing assembly; and

engaging the disposable housing assembly with the reusable housing assembly.

2. The method of claim 1, wherein the guide passage is configured to taper such that the proximal opening of the guide passage is smaller than the distal opening of the guide passage.

3. The method of claim 2, wherein the guide passage is an angled bevel.

4. The method of claim 1, wherein the adapter further comprises at least one button assembly, a button assembly actuator, and a pump chamber actuator, wherein the actuation of the button assembly actuator actuates the pump chamber plunger actuator and wherein the pump chamber plunger actuator actuates a pump chamber membrane before the at least one button assembly is actuated.

5. The method of claim 4, wherein the method further comprises the act of actuating the button assembly actuator.

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